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Panel Assembly with Ornamental Façade for use in Skirting for Manufactured/Modular Building or as Hedging

BACKGROUND OF THE INVENTION

In general, the present invention relates to skirting assemblies for building structures (including modular/manufactured structures, associated stairwell structures, *etc.*, whether used for residential or commercial/governmental purposes), and panel assemblies for use in hedging/retaining-walls/walkways and other such landscape features. The assembly is typically fabricated at a factory or warehouse then shipped to a building or landscape(d) site as kits, partial or full assemblies, for installation around the lower perimeter (ground-to-building interface) of the manufactured and mobile homes and buildings, commercial buildings, residential dwellings, and the like, or for assembly into hedging/retaining-walls/walkways and other such landscape features, for aesthetic and structural purposes.

More particularly, the invention is directed to a new lightweight skirting assembly adapted for use in providing structural support at the ground-to-building interface as an upwardly directed extension to a foundation along with having an outwardly-directed surface to which an ornamental façade is affixed. The ornamental façade can be *any* artificial front comprising one or more types of a wide range of raw, natural and manmade materials, made to resemble the siding of a building or some other landscape feature (*e.g.*, hedging/retaining-wall of rock, brick, railroad ties, wood or log fencing, lighted walkway, and so on). Each of the assemblies is preferably fastened adjacent one another, side-by-side or stacked atop, and adapted for securing along a foundation within a ground, such as the footing perimeter and cross-runner(s) of a building structure, perimeter foundation around or along an area or parcel of real estate (yard, garden area, park, parking lot, *etc.*), foundation extending along a walk- or roadway, and so on. Several panels of the invention fastened together according to the invention produces a system that provides an amount of structural integrity and operates as an aesthetic barrier functioning as a back-fill support, a cover of ground-level imperfections and utilities (tubing, wiring/cabling, pipes, ductwork, building framing, *etc.*), as well as providing a level interface line beneath the wood, metal, vinyl, stucco, brick, stone, concrete, glass, *etc.*, siding of a building, and so on.

One can readily appreciate the many fundamental distinguishing features of the instant invention from conventional skirting and traditional landscape retaining-walls/ hedging. While the current decorative skirting designs provide a certain amount of stability, few of these conventional panel designs provide much, if any, structural compression-support. Furthermore, regarding the select few current designs purporting to provide structural support, each is absent any plastic support framework as well as the unique angle iron shaped vertical supports contemplated by the instant invention. Skirting used beneath modular/manufactured dwellings requires not only compression-support but also sufficient strength and structural integrity to accommodate the shear stresses experienced as a result of at least partial immersion in soil, clay, sand, *etc.* (the composition of which varies greatly from region to region and includes moisture and other corrosives). None of the conventional skirting or hedging/retaining-wall/walkway panel designs include built-in illumination source(s).

SUMMARY OF THE INVENTION

It is a primary object of this invention to provide a panel having an ornamental façade adapted for securing to a foundation. The panel may be assembled to produce a skirting system for building structures (including modular/manufactured structures, associated stairwell structures, *etc.*, used for residential or commercial/governmental purposes) or in hedging/retaining-walls/walkways and other such landscape features, all within the spirit and scope of this technical disclosure.

In a first characterization, the panel has a plastic member comprising an outwardly-directed surface to which the ornamental façade is affixed, and an inwardly-directed surface to which a plastic support framework is integrally coupled. The support framework comprises a first section having a cross-section shaped in any suitable form (tubular or solid) such as that of a square, rectangle, triangle, circle, oblong, an irregular polygon, or irregular in shape (including shapes comprising any combination of straight edges and/or curvilinear sections); the support framework is located generally along the periphery of the inwardly-directed surface and further includes at least one interconnect section extending between the first section. The interconnect section of the support framework may likewise be tubular or solid and of a similar, or different, cross-sectional shape as the first section. The support framework may comprise additional interconnect sections that may also extend between the first section. For example, one or more of these interconnect sections may

comprise a bend between distal ends from which the interconnect section extends from the first section. The one or more interconnect sections may form a diagonal "/" shape, an "**X**" shape, "**H**" shape, "**ll**" shape, or any other shape interconnecting the framework from one side to another side of the first section. A plurality of apertures are provided through a lower length of the first section, sized for accepting a fastener that permits the securing of the panel to the foundation (such as, for example, bolts, nails, screws, stakes/pins, rivets, pins, clamps and other latching mechanisms, *etc.* with or without an adhesive material for additional strength).

As one will appreciate, additional distinguishing features are many: The first section may further comprise a right-side section, left-side section, and upper section—each of these sections may include a plurality of apertures therethrough. By way of example, only, the panels may be arranged such that the left-side section of one is secured to the right-side section of an adjacent side-by-side panel, and/or the upper section of a ground-level panel may be secured to the lower length of a panel adjacent and atop the ground-level panel. Fasteners can be utilized in connection with the apertures of the left-side section, right-side section, upper section and lower length, respectively. For example, the apertures through the upper section may be sized for accepting another fastener permitting the securing of the panel to a lower support of a manufactured/modular type building structure or to an adjacent (atop or side-by-side) panel. Suitable fasteners include, for example, bolts, nails, screws, rivets, clamps and other latching mechanism, pins/dowels, specialty fasteners such as those used for securing wall hangings to drywall, and so on, with or without an adhesive material for additional strength. Other securing mechanisms are contemplated hereby for the securing of panel(s) to a building structure or to adjacent panels—suitable securing mechanisms include: adhesives compatible with the materials being joined; weld spots, soldering, or other thermally-produced joints using a material selected for compatibility with the material(s) out of which the framework section(s) and/or the support joist of the building structure; interlocking surfaces (such as mating tongue-and-groove type edges along the top of the upper section and building structure support joists) that may be interlocked in a snap-fit or in sliding-fit fashion coupled with suitable adhesive; and so on.

The outwardly-directed surface may be generally planar, or have any suitably-shaped surface that accommodates the type of ornamental façade selected. For example, to

accommodate larger stones or rock, logs or wood siding, and so on, the outwardly-directed surface may include indented or curved regions sized for accepting the rock, logs, *etc.* to fit therewithin; alternatively to match house siding, the outwardly-directed surface may be tiered, and so on. The ornamental façade may comprise any one or more types of a wide variety of items having been affixed to the outwardly-directed surface using any suitable adhesive; by way of example, such items include pebbles, glass block, artificial stone, log sections, wood siding, metal siding, vinyl siding, brick, tiles, sand, stucco, clay, and rock. While the outwardly-directed surface may be rectangular, square, or triangular in shape, the outwardly-directed surface may take on a myriad of other regular and irregular polygon shapes, or be irregular in shape (including shapes comprising any combination of straight edges and/or curvilinear sections). Associated features of the panel will be accordingly sized and fabricated of material(s) having sufficient strength to provide support, for example, where the panel is intended to serve a weigh-bearing function (whether to aid in support of a building structure or used in a column of panels atop one another).

The support framework and the plastic member may be integrally fabricated by any suitable process, such as: injection molding (such as reaction injection molding, *i.e.*, RIM), structural foam molding, blow molding, transfer molding, compression molding, thermoforming, and adhesion of the framework and plastic member (having been separately extruded earlier), all according to well known plastic production techniques.

Further unique to the invention is an ornamental façade that also includes an illumination source. The illumination source may comprise an incandescent light source or an arc light along with a fixture and/or a photo-voltaic cell and battery for more-efficient outdoor use. Incandescent light sources include those that use a filament; arc lights use an electrical arc running through a gas plasma. The outwardly-directed surface may further comprise a port-hole for use in connection with the illumination source; for example, the fixture may be arranged with an electrical cabling passing through the port-hole to 'hide' other electrical components such as connectors and outlet(s), if needed, to connect the illumination source to a power/voltage source. The port-hole may be conveniently sized to provide ventilation from one side of the panel through to the other, with or without a grating cover depending on aesthetic preference.

The panels are arranged as skirting or hedging/retaining-wall/walkway structures and other such landscape features (for example, circumscribing a ground-area), atop a foundation comprised of a compressive-support material poured and set, stacked, filled, or otherwise constructed within a ground employing known techniques in a manner that will accommodate anticipated compressive and shear stresses. Suitable compressive-support materials include cement, masonry, brick, slate, rock, structural soil fill, clay, sand, *etc.*

In a second characterization, the panel has a member comprising an outwardly-directed surface to which the ornamental façade is affixed, and an inwardly-directed surface to which a plastic support framework and right and left vertical supports are coupled. The support framework comprises a first section at least located generally along a top periphery of the inwardly-directed surface. Once again, the framework may have a cross-sectional shape (tubular or solid) in any suitable form such as that of an oval, circle, regular or irregular polygon, or irregular in shape. Each of the right and left vertical supports comprises an angle iron shaped extension, a top-end and lower-end of which has a respective ledge permanently affixed. While "angle iron" is often used in connection with a length of metal, alloy, or any substantially rigid plastic having an "L" shaped cross-section, as used herein, the cross-section of the angle iron shaped extension preferably has at least one angle—not necessarily 90degrees—interposed between a first and second leg; the first and second leg may be generally equal in length or of different lengths, as is the case of an "L". When at least two panels are adjacently arranged such that the left vertical support of one panel is secured with a respective right vertical support of the adjacent panel, the two adjacent angle iron shaped extensions may be secured to one another with suitable fasteners and/or adhesives with opposing back-faces in contact. By way of example, where the angle iron shaped extensions each have an "L" shaped cross-section with the shorter leg of the "L" having been coupled to the inwardly-directed surface of the panel member, the back-faces of the longer leg of the "L" may be arranged in contact and secured such that a "T" shaped combined extension is created and interposed between adjacent panel members (for example, see FIG. 4).

Additional distinguishing features are many: Each of the lower-end ledges may include an aperture for accepting a fastener permitting the securing of the panel to the foundation. An aperture through the top-end ledge may be used in connection with a fastener to secure the top-end ledge to a lower support, such as a floor joist, of a

manufactured/modular building or to another panel arranged atop. The first section of the support framework may be equipped with a plurality of apertures for accepting fastener(s) permitting securing of the panel's framework to the building lower support or an adjacent (atop) panel. The angle iron shaped extension may also be equipped with a plurality of apertures for accepting second fasteners permitting the securing of a left vertical support with a respective of right vertical support of an adjacent (side-by-side) panel.

The first section may also be comprised right-side and left-side sections coupled to the inwardly-directed surface a distance from a respective right and left periphery of the inwardly-directed surface. This distance provides spacing for coupling the right and left vertical supports to the inwardly-directed surface: For example, the right vertical support may be coupled to the inwardly-directed surface within the distance from the respective right periphery, and the left vertical support may be coupled to the inwardly-directed surface within the distance from the respective left periphery. This coupling may be by way of employing fasteners, welding or other thermally-produced joints, and/or an adhesive—such that it provides a sufficiently secure coupling of the vertical supports and inwardly-directed surface, and will depend upon materials out of which they are made. Once again, the support framework and the member, if made from a plastic, may be integrally fabricated by any suitable process, such as: injection molding (such as reaction injection molding, *i.e.*, RIM), structural foam molding, blow molding, transfer molding, compression molding, thermoforming, and adhesion of the framework and plastic member (having been separately extruded earlier), all according to well known plastic production techniques.

In another characterization, the invention includes a method of producing a panel having an ornamental façade adapted for securing to a foundation. The method includes the step of integrally fabricating a plastic support framework comprising a first section located generally along the periphery of an inwardly-directed surface of a plastic member and at least one interconnect section extending between the first section; this fabrication may be performed by a process such as: injection molding, structural foam molding, blow molding, transfer molding, compression molding, thermoforming, and adhesion of the framework and plastic member having been separately extruded. The ornamental façade is then affixed to an outwardly-directed surface of the plastic member. A plurality of apertures can be provided through a lower length of the first section, each aperture sized

for accepting a fastener permitting the securing of the panel to the foundation. Where the first section further includes right-side and left-side sections, apertures can also be provided therethrough; the panels may then be arranged with a left-side section of one panel secured to a right-side section of an adjacent panel by using fasteners through these apertures. The step of integrally fabricating a plastic support framework generally along the periphery of an inwardly-directed surface can further comprise fabricating the right-side and left-side sections of the first section to have a cross-section that is tubular or solid, in the form of a variety of shapes as mentioned above. Prior to or after affixing the ornamental façade, an illumination source within the ornamental façade may be added; this may include arranging and securing a fixture and a visual light source on the plastic member.

As one will appreciate, certain of the several unique features of the invention, as well as unique combinations of features, all supported and contemplated hereby may provide a variety of advantages including versatility of use/application, portability, flexibility in design, and so on. The basic panel structure is adaptable for supporting a wide variety of shapes and sizes, ornamental façades, lighting types, ventilation configurations, *etc.* Portions of the panels may be preassembled for portability and handy arrangement into a building skirting, hedging/retaining-wall/walkway and other landscape feature(s), on-site. The new panel is preferably sized for manipulation and set-up on-site by individual(s). Different configurations and material(s) of the support framework coupled to the inwardly-directed surface make the panel(s) adaptable to handle different or uneven loads within a variety of ground/landscape environments. These and other advantages of providing the new panel design, and associated method of producing a panel having an ornamental façade adapted for securing to a foundation, will be appreciated by perusing the instant technical discussion, including the drawings, claims, and abstract, in light of drawbacks to existing modular skirting structures that have been identified, or may be uncovered.

BRIEF DESCRIPTION OF THE DRAWINGS

For purposes of illustrating the innovative nature plus the flexibility of design and versatility of preferred and alternative structures and method of producing panels, supported and disclosed hereby, the invention will be better appreciated by reviewing the accompanying drawings (in which like numerals, as included, designate like parts). One can appreciate the many features that distinguish the instant invention from traditional,

known modular skirting. The drawings have been included to communicate the unique features of the innovative structures of the invention by way of example, only, and are *in no way* intended to unduly limit the disclosure hereof.

FIG. 1 is an isometric front view of alternative preferred panels 10, 20, 30 in an adjacent side-by-side arrangement according to the invention for securing to a foundation 40; illustrated by way of example are core, as well as further unique and distinguishing features for utilizing the structures represented hereby.

FIG. 2 is an isometric, partially exploded assembly front view of panel 10 in an adjacent arrangement atop another panel 60.

FIG. 3 is a top plan view of a foundation layout such as may be configured below a modular/manufactured building.

FIG. 4A is an isometric, partially exploded assembly back view of panel 80 in an adjacent arrangement side-by-side another panel 100.

FIG. 4B is partial sectional view taken along **4B—4B** of FIG. 4A.

FIGs. 5 - 7 are isometric back views of alternative panels 140, 160, 170 depicting alternative support framework configurations coupled to inwardly-directed surfaces 145, 165, and 175, respectively, by way of example.

FIG. 8 is an isometric view of a support framework 250 configured in a manner as that depicted in FIG. 5.

DETAILED DESCRIPTION OF EMBODIMENTS DEPICTED IN DRAWINGS

In connection with discussing the unique features depicted in FIG. 1 and FIG. 4A, occasional reference will be made back-and-forth to other of the figures which detail core, as well as further unique and distinguishing features of panel assemblies of the invention. As one can appreciate, the figures provide a pictorial demonstration of the flexibility of design and use of applicant's invention. The panel configurations are especially suitable for building skirting and hedging/retaining-wall/walkways and other such landscape structures. The panels are preferably secured to a foundation. The foundation is typically within a ground; the ground may be of a variety of compositions. While the panels depicted in the figures are rectangular in shape, this is for purposes of illustration, only. As mentioned, outwardly-directed surfaces can be of a *myriad* of shapes and sizes and will accommodate a wide variety of ornamental façades comprised of natural and manmade items of all sorts. Weight/size of a panel, its framework with or without vertical supports, may vary depending upon use (*e.g.*, as skirting or hedging) and anticipated environmental

elements to which it will be exposed (*e.g.*, in clay-packed soil, in sandy soil, in an open area where wind gusts are expected such as along a highway or other roadway/pathway or around a park/open-space, and so on. For very caustic environments or if used under heavy building structures, the panel, its framework and/or vertical supports will require greater strength and higher performing more corrosion-resistant materials.

One can appreciate that the number of panel subassemblies arranged adjacent side-by-side or atop, depends on use and perimeter or length of the foundation to which the panels are secured. Panel assemblies of different façades may be adjacently arranged and connected side-by-side such as is shown in FIG. 1 at 10, 20, and 30 for securing to a foundation 40. Panel members 12, 22, 32 each have an outwardly-directed surface to which the ornamental façade 14, 24, 34 is affixed; opposite that is an inwardly-directed surface to which a plastic support framework is integrally coupled.

The support framework sections (*e.g.*, those labeled 16-17-18, 26-27-28, 36-37-38) are shown with rectangular cross-sections; however, the cross-section may be shaped in any suitable form (tubular or solid) such as that of a square, rectangle, triangle, circle, oblong, an irregular polygon, or irregular in shape (including shapes comprising any combination of straight edges and/or curvilinear sections). The support framework is located generally along the periphery of the inwardly-directed surface (better viewed from the back in FIGs. 4A, 5 - 7) and can further include an interconnect section (*e.g.*, FIGs. 5 - 7 at 156, 158, 161, 171a-e) that extends between the perimeter section(s); by way of example see FIG. 4A at 86 - 89, FIG. 5 at 146 -149a/b, 159a/b, 157, FIG. 6 at 166 - 169, and FIG. 7 at 176 - 179. The interconnect sections (*e.g.*, FIGs. 5 - 7 at 156, 158, 161, 171a-e) may likewise be tubular or solid and of a similar, or different, cross-sectional shape as the first section. For example as shown in FIG. 7, one or more of these interconnect sections may comprise a bend between distal ends from which the interconnect section extends from the perimeter section. The one or more interconnect sections may form a diagonal "/" shape, an "**X**" shape, "**H**" shape, "**ll**" shape, or any other shape interconnecting the framework from one side to another side. Apertures may be drilled, molded, cut, or otherwise formed through the framework sections and sized for accepting fastener(s) that permit the securing of the panel (in direction of arrows 41a-c, FIG. 1 and arrow 101, FIG.4A) to a foundation (*e.g.*, footing 40, FIGs. 1 and 4A), to an adjacent panel, or to a support member of a modular building (*e.g.*, floor joist/support 50, FIGs. 1

and 4A; building not shown, for simplicity). Such fasteners can include bolts, nails, screws, stakes/pins, rivets, pins, clamps and other latching mechanisms, *etc.* with or without an adhesive material for additional strength.

Ornamental façade 14 and 34 are shown in FIGs. 1 and 2 with illumination sources 44a/b. Each illumination source may comprise an incandescent light source or an arc light along with a fixture, power cabling, and/or a photo-voltaic cell and battery for more-efficient outdoor use. "Solar photo-voltaics" is a phrase used for technology that directly converts the sun's radiation into electricity utilizing a physical process that requires no moving parts. Photo-voltaic cells (solar generators) encapsulated in transparent material, convert sunlight into usable electricity. Incandescent light sources are those that use a filament within a bulb to produce visible light; whereas arc lights use an electrical arc running through a gas plasma. Arc lights are further divided into high-pressure arc lights (where light is produced in a dimensionally small bulb of high pressure gasses) and low-pressure arc lights (which has a dimensionally big tube of low pressure gas plasma is employed). Preferably, an outdoor use light source and associated fixture(s) are selected. Cabling and/or battery power sources must likewise be of a design that can withstand outdoor use (*i.e.*, inclement weather). Examples of incandescent lights include the 60 and 100 Watt light bulbs often used in indoor lighting, and as auto and bicycle headlamps. Incandescent lights come in a number of variants, which go under the names of "vacuum", "krypton", "xenon", "halogen", and "quartz-halogen". Examples of high pressure arc lamps include mercury vapor lamps, high pressure sodium arc lamps, and metal halide arc lamps. These are often found in street lamps, and industrial and stadium lighting. Examples of low pressure arc lamps include fluorescent lights, of the sort we often use in homes and offices, germicidal UV lamps, and neon sign lamps.

The outwardly-directed surface may further comprise a port-hole (*e.g.*, at 94 in FIG. 4A, at 144a-c in FIG. 5, and at 174 in FIG. 7) for use in connection with the illumination source. For example, the light fixture may be arranged with an electrical cabling passing through the port-hole to 'hide' other electrical components such as connectors and outlet(s), if needed, to connect the illumination source to a power/voltage source located on the other side of the panel. One or more additional port-holes may be included (*e.g.*, at 67a/b in FIG. 2, 163 in FIG. 6, and 173 in FIG. 7) and conveniently

sized to provide ventilation from one side of the panel through to the other, with or without a grating cover depending on aesthetic preference.

The framework, while appearing to have separately constructed right-side, left-side, upper, and/or lower, plus interconnect, *etc.*, sections—one or more of which may include a plurality of apertures—it may be machined, extruded, molded or otherwise formed as a single framework (e.g., see FIG. 8), or as a single rectangular frame (*e.g.*, at 166 - 168, FIG. 6) joined or bonded to a separately constructed interconnect section (*e.g.*, 161, FIG. 6). As mentioned, the framework sections may be integrated to the panel member (shown throughout at 12, 22, 32, 82, 112, 142, 162, 172) by way of adhesion/fastening, molding/forming, *etc.*, to produce a unitary panel assembly. Panels 10, 20, and 30 have been arranged in FIG. 1 such that the left-side section 26 of one 20 is secured to the right-side section 18 of adjacent panel 10.

Apertures (not shown for simplicity) through the upper sections 17, 27, 37 of each panel may be sized for accepting fasteners permitting the securing of panels 10, 20, 30 to a lower support 50 of a manufactured/modular type building structure or to an adjacent (atop or side-by-side) panel. In FIG. 2, the upper section of ground-level panel 60 is ready to be secured (arrow 61) to the lower length of panel 10 adjacent and atop the ground-level panel 60 by way of suitable fasteners 69a/b. Suitable fasteners include, for example, bolts, nails, screws, rivets, clamps and other latching mechanism, pins/dowels, specialty fasteners such as those used for securing wall hangings to drywall, and so on, with or without an adhesive material for additional strength. Other securing mechanisms are contemplated hereby for the securing of panel(s) to a building structure or to adjacent panels—suitable securing mechanisms include: adhesives compatible with the materials being joined; weld spots, soldering or other thermally-produced joints using a material selected for compatibility with the material(s) out of which the framework section(s) and/or the support joist of the building structure; interlocking surfaces (such as mating tongue-and-groove type edges along the top of the upper section and building structure support joists) that may be interlocked in a snap-fit or in sliding-fit fashion coupled with suitable adhesive; and so on.

The outwardly-directed surface may be generally planar (as depicted in FIGs. 1, 2, and 4B at 113 and 83), or the outwardly-directed surface can have any suitably-shaped surface that accommodates the type of ornamental façade selected. For example, to

accommodate larger stones or rock (at 34, FIG. 1), stucco or pebbles (at 14, FIG. 1), logs or wood siding (at 24, FIG. 1), and so on, the outwardly-directed surface may include indented or curved regions sized for accepting the rock, logs, *etc.* to fit therewithin; alternatively to match house siding, the outwardly-directed surface may be tiered, concave, convex, and so on. The ornamental façade may comprise any one or more types of a wide variety of items having been affixed to the outwardly-directed surface using any suitable adhesive; by way of example, such items include pebbles, glass block, artificial stone, log sections, wood siding, metal siding, vinyl siding, brick, tiles, sand, stucco, clay, and rock. While the outwardly-directed surface may be rectangular, square, or triangular in shape, the outwardly-directed surface may take on a myriad of other regular and irregular polygon shapes, or be irregular in shape (including shapes comprising any combination of straight edges and/or curvilinear sections). Associated features of the panel will be accordingly sized and fabricated of material(s) having sufficient strength to provide support, for example, where the panel is intended to serve a weigh-bearing function (whether to aid in support of a building structure or used in a column of panels atop one another).

FIG. 3 is a top plan view of a foundation layout such as may be configured below a modular/manufactured building. Beneath the walls of the building is a concrete, or other suitable compressive-support material, footing perimeter 73. The panels are arranged atop the footing perimeter 73 to create a skirting system circumscribing the ground area beneath the building, which may be hoisted with jacks positioned at locations identified as 74. The foundation may be comprised of a compressive-support material poured and set, stacked, filled, or otherwise constructed within a ground employing known construction techniques in a manner that will accommodate anticipated compressive forces acting downwardly on the foundation, and shear stresses of the ground (composed of soil, sand, clay, bedrock, *etc.*). Suitable compressive-support materials include cement, masonry, brick, slate, rock, structural soil fill, clay, sand, *etc.*

The partially exploded assembly back view of panel 80 in FIG. 4A illustrates further unique features of the invention. Integrally coupled to panel member 82 is support framework comprised of sections labeled 86 - 89, with sections 87 and 89 having apertures labeled, respectively, 107a-c and 109a-c. Fasteners 105a-c may be inserted though apertures 107a-c and into support 50 for securing panel 80 thereto. Fasteners 108a/c may be inserted through apertures 109a/c and into foundation 40 at respective locations 104c,

104e. Right and left vertical supports 98R and 98L of panel assembly 80 each have an angle iron shaped extension 92R, 92L; each extension has a ledge permanently affixed to the extension's top-end and lower-end (respectively labeled 93R, 96R and 93L, 96L). Each ledge 93R, 93L has been provided with an aperture 103R, 103L through which a fastener, such as that shown in exploded view at 128, may be placed for securing panel 80 to support 50. Each extension 92R, 92L has apertures labeled 91a-c, 132a-c for accepting fasteners (*e.g.*, such as those represented at 131a/c) adapted for securing adjacent vertical supports together. Vertical support 98L, in exploded view, is assembled (in the direction of arrow 90) and suitably coupled (*e.g.*, bonding/adhesion, welding/soldering or other thermal joining, fasteners, *etc.*) to the area labeled 85 of panel member 82. Dimensional arrows labeled dR, dL identify respective distances from the right- and left-side periphery of inwardly-directed surface 95 (please see, also, FIG. 4B). Preferably, distances dR, dL are such that the angle iron extension of each respective vertical support 98R, 98L can be suitably coupled, adjacent the framework, to the inwardly-directed surface 95.

Illustrated, also, in FIG. 4A (and its cross-sectional view, FIG. 4B, along **4B—4B**) is panel 100 arranged in exploded view adjacent panel 80. Vertical support 198R is coupled to inwardly-directed surface 115 of panel member 112, adjacent framework section 118. Angle iron shaped extension 122 has apertures 121a-c through which fasteners, such as those labeled 131a/c, may be inserted for securing vertical support 198R to vertical support 98L. Sections 117, 119 are integrally coupled to section 118 to form the framework. Each ledge 133, 125 has been provided with an aperture 123 (the other not labeled, for simplicity) through which a fastener, such as that shown in exploded view at 127, may be inserted to secure panel 100 to support (*e.g.*, floor joist) 50. Fastener 129 is used to aid in securing panel 100 to foundation 40 at 104g. Fastener 126L, inserted through aperture 106L, is used to aid in securing panel 80 to foundation 40 at 104f (arrow 101 illustrates direction of assembly). As mentioned above, fasteners 108a/c can be inserted through apertures 109a/c to further support the securing of panel 80 to foundation 40. Fastener 126R, inserted though aperture 106R, is used to aid in securing panel 80 to foundation 40 at 104b. A port-hole is shown at 94 which may be used in connection with an illumination source; and port-holes for ventilation through panel member 82 are shown at 97a/b having grating to prevent large debris from passing through.

In FIG. 4B, one can see the "L" cross-sectional shape of extensions 92L, 122 may have legs nearly-equal in length (through one leg of each extension 92L, 122 is an aperture, respectively labeled 132b, 121b). As mentioned, while "angle iron" is often used in connection with a length of metal, alloy, or any substantially rigid plastic having an "L" shaped cross-section, as used herein, the cross-section of the angle iron shaped extension preferably has at least one angle—not necessarily 90degrees—interposed between a first and second leg; the first and second leg may be generally equal in length or of different lengths, as is the case of an "L". One can see that, by way of example here, framework sections 118, 86 have a rectangular, tubular cross-section. Outwardly-directed surfaces 83, 113 of panel members 82, 112 are generally planar with items labeled 84, 114 affixed to create the ornamental façade.

As discussed above, FIGs. 5 - 7 are isometric back views of alternative panels 140, 160, 170 depicting alternative support framework configurations coupled to inwardly-directed surfaces 145, 165, and 175, respectively, by way of example. In FIG. 7, perimeter sections are labeled 146 - 148, 149a/b, 159a/b, and 157, with interconnect sections labeled 156, 158. FIG. 8 is an isometric view of a support framework 250 configured in a manner similar to that depicted in FIG. 5. Perimeter sections labeled in FIG. 8 are 246 - 248, 249a/b, 259a/b, and 257, with interconnect sections 256, 258. The support framework and the plastic member may be integrally fabricated into a unitary piece by way of suitable process, including: injection molding (such as reaction injection molding, *i.e.*, RIM), structural foam molding, blow molding, transfer molding, compression molding, thermoforming, or adhesion of the framework and plastic member (having been separately extruded earlier), all according to well known plastic production techniques. The support framework and plastic member may be made of a wide variety of materials; selection criteria may include corrosion resistance, weight to material strength and structural integrity, manufacturability and integration with other components. Suitable materials include thermoplastic structural foam, fiberglass reinforced RIM materials, thermally formed composites, and so on. The specific type of material out of which the framework and plastic member is made will be determined hand-in-hand with the process selected to integrally fabricate those components. Against the inwardly-facing surface a insulation material will often be used in the case where the panel assembly is used in skirting; traditional housing/building materials suitalble for use include: fiberglass, urethane foam, and the like. This insulation may be secured/bonded using traditional

mechanisms such as adhearded paper backing or wood/cardboard/steel backing fastened to the perimeter sections of framework and/or angle iron type extensions; or a plastic backing welded or otherwise thermally fused or attached to the framework and/or angle iron type extensions.

As mentioned, the tubular or solid sections of the framework are preferably made of a lightweight material having sufficient strength for supporting anticipated weights to which it will be exposed. For example, if a panel is intended for use as skirting for a modular/manufactured building that, the panel framework and any vertical supports used will have to provide sufficient compressive-support and accommodate anticipated ground-soil sheer stresses. If the panel is intended for use in hedging assembly, less compressive-support will be required, however, the panel framework preferably is selected to withstand sheer stresses associated with ground-soil composition, as well as wind gusts, snow, rain, *etc.*, associated with inclement weather. A multitude of plastic and metal materials are contemplated for use according to the invention in connection with fabricating the panel member, its framework, and vertical supports — and components thereof — including resins, generally rigid plastics (both thermoplastic and thermosetting structures), alloys, and metals.

By way of background: The thermoplastics include those plastics having polymer chains more-easily broken with heat, such as polystyrene, polycarbonate, polyarylate, polybutylene, medium- to high-density polyethylene(s), and acrylic, in particular, thermoplastic structural foams are useful according to the invention. The polymer chains in thermosetting plastics typically do not separate completely with heat. After being fully cured, thermosets cannot be resoftened by heat; thermosets include polyester, silicone, urethane, urea-formaldehyde. The term 'alloy' refers to any *combination* of elements typically having metallic properties. Resins are any of a class of solid or semisolid organic products of natural or synthetic origin with no definite melting point, generally of high molecular weight—typically composed of a polymer. In any case and as one can appreciate, many well known manufacturing techniques exist (such as extruding/extrusion, casting, pulling, many types of molding, machining, cutting, and so on) that are suitable for use in fabricating the framework sections, vertical supports, and panel members. Structural foam molding is a process of molding thermoplastic articles with a cellular core and integral solid skins in, generally, a single operation. Material weight-to-strength ratio

is targeted to be on the lower side for components of panels where portability is key. By way of example *only*, a panel may be made using a structural foam RIM process; fasteners may be selected from off-the-shelf standard or special-order (including those that are plated): bolts, nails, screws, and pins, clamps, plastic welding, adhesion, ultrasonic fusion.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, those skilled in the art will readily appreciate that various modifications, whether specifically or expressly identified herein, may be made to any of the representative embodiments without departing from the novel teachings or scope of this technical disclosure. Accordingly, all such modifications are contemplated and intended to be included within the scope of the claims. Although the commonly employed preamble phrase "comprising the steps of" may be used herein in a method claim, applicants do not intend to invoke 35 U.S.C. §112 ¶6. Furthermore, in any claim that is filed herewith or hereafter, any means-plus-function clauses used, or later found to be present, are intended to cover at least all structure(s) described herein as performing the recited function and not only structural equivalents but *also* equivalent structures.